DOCUMENT RESUME

ED 245 152 CG 017 523

AUTHOR Bright, Larry K.; Smaby, Marlowe H.
TITLE Interactive Videodisc Learning Systems: The Promise of New Access to Counseling Services.
PUB DATE 25 Oct 83
NOTE 17p.; Paper presented at the North Central Association for Counselor Education and Supervision "Creative Leadership and Skill Development" Conference (Chicago, IL, November 3-5, 1983).
PUB TYPE Information Analyses (070) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Counseling Services; *Educational Technology; Interaction; Lasers; *Learning Strategies; State of the Art Reviews; *Technological Advancement; *Videodisc Recordings; Video Equipment
IDENTIFIERS *Interactive Videodisc; Learning Systems

ABSTRACT

This paper describes the technology involved in interactive videodisc learning systems and their potential role in counseling services. Following a brief introduction to interactive videodisc technology, the components of the interactive videodisc learning system are described and illustrated. The strengths of the videodisc (randomly-addressable technology and high speed responses) compared to the weaknesses (linear formats, no choice of learning routes, or difficulty of material) of current learning technologies (books, lectures, film, television) are discussed. Three levels of videodisc interactivity are described, i.e., question/answer, analyzed learner responses and prescribed material, and branched teacher or counselor responses to patterns of learner choices. The features of the videodisc are presented including the shape, information storage capacity, and resolution. The search and retrieval capabilities of the videodisc are discussed with particular emphasis on the learner's control of the lessons. Examples of uses of the interactive videodisc system in counseling, medical and psychological training, and instruction are given. The paper concludes with a discussion of four obstacles that may slow the adoption of interactive videodisc programs, i.e., the cost of mastery, the cost of production, the prerogative for development, and non-correctability. (BL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED245152

INTERACTIVE VIDEODISC LEARNING SYSTEMS: THE PROMISE OF NEW ACCESS TO COUNSELING SERVICES

Larry K. Bright, Ed. D., Dean and Professor
College of Education, The University of Minnesota, Duluth
Marlowe H. Smaby, Ph. D., Head and Professor
Department of Psychology

Prepared for Presentation at the

NCACES "Creative Leadership and Skill Development" Conference
November 3-5, 1983, Chicago, Illinois

CG 017523

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

October 25, 1983

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Larry K. Bright

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

INTERACTIVE VIDEODISC LEARNING SYSTEMS: THE PROMISE OF NEW ACCESS TO COUNSELING SERVICES

Interactive videodisc hardware links the microcomputer and television through the miracle of electronics and laser technology. The result is a television screen with human figures that can interact with the viewer! This breakthrough provides a critically needed human means for addressing the impersonal and passive nature of programmed instruction software. Videodisc hardware and production are continuing to decrease in cost. Within this decade this learning technology will be within the reach of human service professionals seeking a means for increasing access to counseling services.

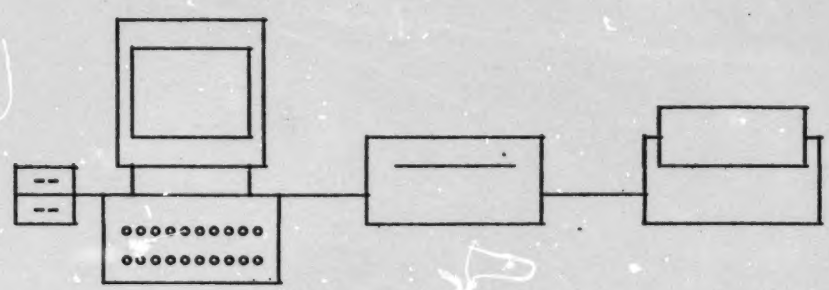
Interactive videodisc technology is the first "high tech" innovation to have the "high touch" capability to interest counselors in becoming seriously involved in computer software development. The potential of this technology depends almost entirely, however, on the initiative that counselors and other instructional designers take in the development of interactive videodisc software. Software needs to be developed which takes full advantage of the interactive capabilities described in this paper.

The Interactive Videodisc Learning System

Interactive videodisc learning systems or stations are currently available from some companies which have explored the uses of video

cassette markets (RCA, Sony, Panasonic). Other corporations with microcomputer products and videodisc playing equipment also have equipment which can be linked into an interactive videodisc learning system. The diagram below indicates the components in a portable learning station for one user:

VIDEODISC LEARNING SYSTEM



Drives Micro Videodisc Recorder Printer

The microcomputer is equipped with digital videodisc control, allowing instantaneous retrieval of any numbered television frame. Current hardware development levels also provide for the microcomputer to have either a keyboard console (for those learners who can type) or a touch sensitive monitor screen. The printer in this system allows learners to have a record of their accomplishments and assignments to take with them. The learning system is inexpensive (approximately $5,000 depending upon capabilities of components), and it is portable. It would be possible to have such a learning station in nearly every school room, counseling office, nursing home, physician's office, or public agency. Within the next few years, it is also probable that this type of learning station may become even less expensive and available in the home.

The capability of the technology will depend on its uses as determined by software yet to be developed. While computer programmers and electrical engineers have produced the hardware with the above capacities, it is the instructional designer who is needed to apply the technology to the human learning needs which can best be addressed. For many educators and counselors, however, the past programmed instruction "technologies" have been a sterile and disinteresting arena for professional work. The repetitious behavioral reinforcement approach of early programmed instruction materials--so much a basic ingredient in the production of most current microsoftware--has yet to attract large numbers of counselors to become instructional software designers. The potential of interactive videodisc to link the live action and nonverbal behavior aspects of television may provide the incentive for future development.

Strengths and Weaknesses of Current Learning Technologies

With the printing press came the first major technological resource for conveying knowledge and education. A book is a randomly-addressable medium, portable, and inexpensive. Yet, even with clever graphics, it lacks the human capability to motivate learners. It lacks sound and motion. Film and television brought a solution to these issues; yet, these video systems, as well as programmed instruction in books and microcomputers, are narrowly linear in form. A learner or viewer must wait through less interesting material to get to other more interesting or desired information. This problem is often associated with lecturers, as well, particularly if there is a threat involved to the

student who interrupts the lecturer. The television presentation or the moving picture cannot be stopped for review; the book has a specified level of reading difficulty; the learner using television or film has no choice of learning route or difficulty of material.

Microcomputer software can be branched to provide alternative learning routes; but without the benefit of the realism of television, most of current microsoftware is yet linear, frame-to-frame, part-to-part-to-whole, and potentially monotonous. While color and graphics can help, there is nothing like television to make issues come to life. And, now the linear problem with television can be solved with videodiscs which are read by a laser which does not have to touch the disc to find a desired frame.

The linear difficulty of having to play a section of film of tape has been solved. This miracle allows the micro-managed videodisc to become a randomly-addressable technology. Yet, better than a book, the videodisc has the human dimension potential through televized figures. If the videotape happens to be prepared by real people known to the learner, and who are a regular part of the learner's life, there is profound potential for the technology to extend access to learning opportunities and to counseling which have not been conceived in the past.

With the laser reader of the data on a disc, the data and filmed action at the start of a disc may be shown with related material at the end of a disc. Because the microcomputer has capability to "keep track" of each frame of information, and because the laser can read data so

rapidly, a myriad of instructional responses to a learner can be made. Many alternatives for learner responses to content can be preplanned and branched on the videodisc, waiting for a combination of learner responses to produce the desired response.

Three Levels of Videodisc Interactivity

Programmed instruction materials, with their "frames" of content and questions and answers, provided a kind of interaction with the learner. There was instant feedback on the correctness of learner responses to questions. Microcomputer software has continued in the tradition of linear programmed instruction. This software can provide this first level of interactivity, but with the addition of some motivational reinforcement comments in print form. There are at least three kinds of interactivity possible with interactive videodisc systems, and the third level is only available with interactive videodiscs.

Level I: (as above) After learner responds to posed questions, feedback is provided on the accuracy of answers; reinforcement remarks can be provided.

Level II: Learner's responses to a series or set of questions or choices are collected and analyzed; the level of difficulty of subsequent material is then prescribed.

Level III: Varied counselor or teacher responses to patterns of learner choices are branched; the counselor or teacher can respond through the screen to the learner, providing personal and human reinforcement and motivation; explanations, assignments, illustrations can be provided by a person who really seems to understand the learner.

While the interactive videodisc has decided advantages over earlier technologies, it is, of course, no substitute for the genuine concern of the excellent counselor or teacher. However, the technology provides the opportunity for increasing significantly the ability of the counselor to provide additional service.

Videodisc Features

The "records" of movies that are available in TV-stereo departments of major retailers are examples of videodiscs. The videodisc is a 12-inch brass disc on which a variety of types of information can be stored. The form of the storage is not limited; motion pictures and stereo sound are what has been stored on commercial videodiscs. These two, as well as computer animation, slides, diagrams, digitalized audio and binary data can all be stored on one videodisc (Clement, 1981). Once stored, the information from any part of the disc may be rapidly recalled and displayed. The storage of massive quantities of information (54,000 still color television frames) that can be retrieved randomly and nearly instantaneously has exciting potential for education in general and counseling specifically. What a treat to have an illustrated and instantly accessible professional library available on an interactive videodisc learning system!

The amount of information that can be stored on one side of a videodisc is enormous. If text alone is stored, any textbook currently available would easily fit on less than one side of a videodisc. If

pictures alone are stored, up to 54,000 different images can be recorded on one side. Depending on the specific type of disk, up to one hour of uninterrupted motion picture film would fit on one disc. In addition to the amount of information that can be stored, the resolution possible is excellent. The videodisc has the potential to offer resolution six times as dense as videotape available today (Butler, 1981).

Search and Retrieval--Interactive Videodisc

A microcomputer can be programmed to control the retrieval of the stored information based on input from a keyboard, touchpad, or voice trigger. When this sophisticated controller is added, the system has an additional dimension of interactivity--it responds to touch. Technological coupling of the videodisc player, the microcomputer and a standard color television for display creates a potentially powerful educational system. On one disc, a person can be introduced to the subject area through a carefully sequenced combination of text, slides, motion pictures, and sound. At appropriate points, verbal questions from a filmed prompter are used to determine if the information is being grasped; based on the user's response, the controlling program takes the user forward for more information, or branches to another part of the disc that has been designed tc further clarify the information.

The most exciting prospect of this process is that the lessons are controlled by the learner. Visual models, explanations of diagrams, appropriate feedback and rapid knowledge of results are all

effectively provided in a truly interactive program. Interactive videodisc systems may provide direct personal response, speedy response and the potential for seeing learner improvement. All of these lead to greater learner control. This is important because the learner's control of his own learning is addictive; the more gotten, the more desired (Schlieve, 1982).

Examples of Uses of Interactive Videodisc Systems

Because of the capability to add the realism of television to masses of stored information, and with the potential for random access to this information, it is obvious why the interactive videodisc technology has been used to date primarily for information storage and retrieval. In career counseling, the capability of the new learning system is endless in storing volumes of occupational or educational data, to display it with real life examples and illustrations, and to discuss the content with the learner.

While computers and interactive videodisc systems may not be able to "counsel" in the complex sense of the word, it is clear that initial assessments and data search functions, reports of tests (scholastic and intelligence), and other data exchanges with students can be accomplished by the learning system. The potential is nearly unlimited for the counselor to use the system as a teaching tool on topics of self-concept, family and peer relationships, conflict, drug abuse, sexual information, or other topics sensitive in groups.

Recently, interest in interactive counseling systems has been renewed. While micro and main frame computerized guidance systems were developed in the early 1970s, federal funding to continue the support of these programs, and the lack of these early systems to maintain learner interest reduced interest in the systems. "They (these early computerized guidance systems) were Model-T variety--they worked, but they could not go very far nor very fast" (Loughary, 1977).

The American Heart Association has developed an interactive videodisc system for teaching cardio-pulmonary resuscitation. A Resusci-Anni is wired into a microcomputer, along with videodisc and television output. As the learner practices compressions and ventilations, information on their effectiveness is relayed to the computer. Appropriate instructions, suggestions, or demonstration footage is displayed on the television screen. The learner is given immediate feedback on performance. ("Media in Health Care Education," 1982)

Counselors who work with clients who do not speak English may find a significant tool in the interactive videodisc learning system. Dual audio tracks in videodiscs allow the learner to listen to audio in one of two languages, in stereo, or in an elementary or advanced version. The same visual information could be used for both English- and non-English-speaking clients, or with clients with different learning skills (Levenson, 1983). Of course, the videodiscs need to be made by an individual skilled in speaking the non-English language in question.

Since videodisc players allow frames to be viewed one at a time

or in continuous motion, the counselor with facilities to produce discs may use this feature to observe selected behavior recorded, such as in group activities. When a frame is selected for an extended review period, videodiscs allow audio to be added to still frame formats. "When combined with a touch screen or peripheral objects, educational experiences can be provided using auditory, visual, and tactile modalities designed to appeal to individual learning patterns" (Levenson, 1983). The counselor interested in helping students with individual learning disabilities and styles may find this capability to be very valuable.

The complexities of the global, information society of continually create stresses and uncertainties in the lives of everyone. Considering the total population, the number of individuals who take advantage of counseling services is small. As an example, the number of aging citizens who may or may not be in senior centers or nursing homes have limited access to counseling services. The interactive videodisc learning system could be made available in most every location in which interested senior citizens could take advantage of information on skills of coping with changes in health and family circumstances. The hardware and software could be managed by family service counseling professionals who could provide on-site followup to software distributed. University centers could become involved in developing networks of community cites in which quality service would be delivered through this high technology as managed by faculty and students (Keener, J. R. & Bright, L. K., 1983).

Counselor education and inservice programming are additional important locations for the use of the new technology. The potential for

interactive videodisc learning systems to be used in counseling simulations has strong merit.

Simulations of medical and psychological emergencies have been developed (DeChenne, 1982). Patients' physical signs are stored on videodiscs. Sources include real life events filmed at hospitals and emergency scenes, enacted dramatizations, and film sections from existing movies. Sounds from specific medical equipment (ECG, monitors, alarms) are also stored for dramatic and educational purposes. Patient symptoms are stored on the microcomputer. Rather than reactions to printed material or computer-text descriptions, the interactive video system necessitates that the student observe the "patient," draw conclusions from those observations, and respond effectively. Additional applications include group observations, simulations of common problems, and presentation of unique individual cases.

The University of Nebraska-Lincoln has developed a disc to assist hearing-impaired children in decision-making skills (LaGow, 1980); and at the University of Houston courseware is currently in development for undergraduate college students on the use of smokeless tobacco (Levenson, 1983). The College of Education and its Departments of Psychology and Health, Physical Education, and Recreation at the University of Minnesota-Duluth are developing the software and network of hardware necessary for providing a both professional nursing home inservice programming and health counseling to nursing home patients.

Obstacles to the Adoption of Interactive Videodisc

The possibilities for educational uses of videodisc technology are evident. Currently, there are problems that may slow the progress of development of effective videodisc programs.

1. Cost of Mastering. One of the reasons for slow development as an instructional aid has been the expense of production. Costs of $100,000-300,000 are not uncommon (Price, 1983). The expense is partially due to the process involved in actually "pressing" the videodisc. Information is "burned" onto the surface of the disc using a low powered laser (Clement, 1981). There are only a few companies (such as 3-M) that can perform this task (about $3,600 for a disc master). However, Panasonic and other manufacturers have introduced low cost videodisc recorders. The impact of the reduction in the price of production may have a profound affect on the use of this technology in this decade.

2. Cost of Production. Educationally effective interactive videodiscs must be carefully planned if they are to have the loops and branches in programming to take full advantage of all three levels of interactivity. This instructional design necessitates the efforts of educators, computer programmers, and media experts. Counselors have much to contribute in this process. What to teach in a unit, how to evaluate progress, how to offer

encouragement and rewards, and how to give help in mastering material are some of the areas the counselor can address. The media expert is needed to determine the lay out of production, how to physically record the information from the various input media to minimize retrieval time, and how to lay out an effective story board. The computer programmer is responsible for developing the software to control efficiently and effectively interac- between the learner and the system.

3. Prerogative for Development. As technological developments continue to ease the production of interactive videodiscs, the question arises as to who should make the videodiscs for use in counseling and human services. Research and development centers, individual educators, educational systems, and commercial companies may find themselves in conflict. How will the public and private sectors vary in costs and quality of production? Should most all professionals become involved in production, or should centers do the development? These questions will be addressed in the 1980s (Bright, L. K. & Smaby, M. H., 1983)

4. Videodiscs Non-correctable. The videodisc cannot be corrected if a mistake is "burned into" the original. This means that errors that escape editing can mean loss of an entire master disc investment (Butler, 1981). Additionally, in areas where information moves rapidly, videodiscs may be outdated at their completion. This, however, is true of most educational productions.

Conclusion

John Naisbitt, a national trend forecaster, has described a series of "megatrends" which currently shape the future of society. He stressed that "society is rapidly moving in dual directions of high tech/high touch, matching each new technology with a compensatory human response" (Naisbitt, 1982). For interactive videodisc technology to have a positive impact on society, it will have to increase both the human and technological contact with people. The counselor has the potential to extend access to valuable counseling services through this new technology, not to substitute for the counselor but to extend opportunities to people who might not otherwise take advantage of the information the counselor has available.

In spite of the obstacles to the adoption of interactive videodisc technology, and even though the use of the technology requires faculty development, the potential of the technology is enormous. "The risks of applying intelligent video, while high, are worth taking; they are more than off-set by the tremendous possibilities of the new technology" Butler, 1981).

REFERENCES

Bright, Larry K. & Smaby, Marlowe H. Micros and interactive video in human services. ACES Conference Proceedings, ERIC, April 11, 1983.

Butler, David W. Five caveats for videodiscs in training. Instructional Innovator, 1981, 26, 16-18.

Clement, Frank. Oh dad, poor dad, mom's bought the wrong videodisc and I'm feeling so sad. Instructional Innovator. 1981, 26, 12-15.

DeChenne, James A. & Evans, Robert. Simulating medical emergencies. Instructional Innovator. 1982, 27, 23.

Keener, John R. & Bright, Larry K. Micros and interactive videodiscs for improving access to health education. Health Education, 1983, 14, 47-50.

LaGow, R. L. Instructional development related to an intelligent videodisc. Journal of Educational Technology Systems, 1979-80, 8, 231-239.

Levenson, Phyllis M. Interactive video: a new dimension in health education. Health Education, 1983, 14, 36-38.

Loughary, J. W. Technology and counseling. Personnel and Guidance Journal, 55, 346-351.

Media in health care education. Instructional Innovator, 1982, 27, 21.

Naisbitt, John. Megatrends: Ten Directions Transforming Our Lives. New York: Warner Books, 1982.

Schlieve, Paul L. & Potvin, Alfred R. Cognitive style, EEG waveforms and brain levels. Human Systems Management. 1981, 2, 329-331.

Price, Barrie Jo & Young, Jon I. How to produce interactive learning programs. Instructional Innovator, 1983, 28, 28-31.